A BUNCH OF INTERESTING QUESTIONS with inequalities

1) Find the area of the regions formed by all the points whose coordinates satisfy all of the following conditions:

a)
$$\begin{cases} x > 0 \\ x - 2y < 7 \\ x + y < 4 \end{cases}$$

$$x + y < 4$$

$$\left[-3 < x < 4 \right]$$

b)
$$\begin{cases} -3 < x < 4 \\ y > 0 \\ 2x + y < 4 \end{cases}$$

$$(2x + y < 4)$$

$$\int xy > 0$$

c)
$$\left\{ x + y < 4 \right\}$$

$$\left| x+y \right| > -\epsilon$$

$$\int x > y$$

c)
$$\begin{cases} xy > 0 \\ x + y < 4 \\ x + y > -4 \end{cases}$$
d)
$$\begin{cases} x > y \\ x + y < 2 \\ x^2 + y^2 < 4 \end{cases}$$

$$|x^2 + v^2| < 4$$

$$e) \begin{cases} |x+y| < 4 \\ |x| < 6 \end{cases}$$

Homework:

1) Draw the regions formed by all the points whose coordinates satisfy all of the following conditions. Find the areas of the regions.

$$\begin{cases} -4 < x < 2 \\ y < 0 \end{cases}$$

$$\begin{cases} y < 0 \\ 2x + y > -8 \end{cases}$$

$$\begin{cases} y < 0 \\ 2x + y > -8 \end{cases}$$

$$\begin{cases} x + y < 0 \\ |x| < 2 \end{cases}$$

$$\begin{cases} |x| < 2 \\ |y| < 3 \end{cases}$$

$$|x| < 2$$

 $|x| < 3$

a)
$$\begin{cases} -4 < x < 2 \\ y < 0 \\ 2x + y > -8 \end{cases}$$
 b)
$$\begin{cases} x + y < 0 \\ |x| < 2 \\ |y| < 3 \end{cases}$$
 c)
$$\begin{cases} x > y \\ xy > 0 \\ x^2 + y^2 < 4 \end{cases}$$
 d)
$$|x| + |y| < 4$$

$$\begin{cases} xy > 0 \\ x^2 + y^2 < 4 \end{cases}$$

$$d) \left| x \right| + \left| y \right| < 4$$

- 2) (Super-challenge) Find the volume of the solid: |x| + |y| + |z| < 4
- Answers homework: 1) a) 36 b) 12 c) π d) 32